

AMENDMENT TO THE CLAIMS

The following list of claims replaces all prior listings and versions of claims in this application:

1. (Currently amended) An injector, comprising:
a medicament cartridge comprising:
a medicament;
a tube having first and second ends and a lumen with a longitudinal axis for retaining the medicament therein;
a needle operatively associated with the second end of the tube and having a piercing end extending into the lumen;
a first stopper within and against the tube in the lumen located at a first position near the second end moveable within the lumen along the longitudinal axis; and
a second stopper within and against the tube in the lumen located at a second position near the first end moveable within the lumen along the longitudinal axis,
wherein movement of the first stopper with respect to the tube from the first position toward the needle causes the piercing end of the needle to pierce the first stopper to create a fluid pathway for the medicament through the needle, and movement of the second stopper with respect to the tube from the second position toward the second end of the tube compresses the medicament held between the second stopper and the first stopper so that the medicament is expelled through the fluid pathway;
wherein the injector is a jet injector.
2. (Previously Presented) The injector of claim 1, wherein movement of the second stopper toward the second end of the tube compresses the medicament between the first stopper and the second stopper to move the first stopper toward the second end of the tube to allow the piercing end of the needle to pierce the first stopper and create the fluid pathway for the medicament through the needle.

3. (Previously Presented) The injector of claim 1, wherein the piercing end of the needle has a bevel.

4. (Previously Presented) The injector of claim 1, wherein the needle has an injecting tip extending beyond the second end of the tube.

5. (Currently amended) The injector of claim 4, wherein the injecting tip of the needle has a bevel and is configured for insertion into a patient who is receiving the injection.

6. (Previously Presented) The injector of claim 1, wherein the tube is cylindrical.

7. (Previously Presented) The injector of claim 1, wherein the lumen has a portion with an enlarged diameter, and further comprising a third stopper within the lumen located between the second stopper and the enlarged diameter and moveable within the lumen along the longitudinal axis into the large diameter for providing a bypass for the medicament disposed between the second and third stoppers to pass to a chamber between the third and first stoppers.

8. (Canceled)

9. (Previously Presented) The injector of claim 1, wherein the first stopper has a frustroconical shape.

10. (Previously Presented) The injector of claim 9, wherein the second stopper has a medicament contacting surface configured and dimensioned to mate with the frustroconical shape of the first stopper to minimize volume of medicament remaining in the lumen after the injection is completed.

11. (Previously Presented) The injector of claim 1, wherein the first stopper has a dimple and narrow cross-section where the needle penetrates the first stopper.

12. (Previously Presented) The injector of claim 1, wherein the lumen has a cylindrical shape.
13. (Previously Presented) The injector of claim 1, wherein the cartridge is configured for use in combination with an injection device for firing the cartridge to expel the medicament.
14. (Canceled)
15. (Previously Presented) The injector of claim 24, wherein the medicament is a liquid pharmaceutical preparation containing insoluble particles.
16. (Previously Presented) The injector of claim 1, further comprising an injection device configured for firing the cartridge to expel the medicament.
17. (Previously Presented) A jet injector, comprising:
a medicament cartridge comprising:
a medicament comprising first and second medicament components;
a tube having first and second ends and a lumen with a longitudinal axis for retaining the medicament therein, wherein the lumen has a portion with an enlarged diameter;
a needle operatively associated with the second end of the tube and having a piercing end extending into the lumen;
a first stopper within the lumen located near the second end moveable within the lumen along the longitudinal axis;
a second stopper within the lumen located near the first end moveable within the lumen along the longitudinal axis; and
a third stopper within the lumen located between the second stopper and the enlarged diameter and moveable within the lumen along the longitudinal axis, wherein the first medicament component is disposed between the second and third stoppers, and the second medicament component is present between the third and first stoppers;

wherein movement between the first stopper and the needle causes the piercing end of the needle to pierce the first stopper to create a fluid pathway for the medicament through the needle and movement of the second stopper toward the second end of the tube compresses the medicament held between the second stopper and the first stopper so that the medicament is expelled through the fluid pathway;

wherein movement of the third stopper to the enlarged diameter portion allows the first and second medicament components to mix to form the medicament.

18. (Currently amended) A method of injecting a medicament, comprising:
providing a medicament within a lumen of a tube in a jet injector, the tube having first and second ends and between first and second stoppers that are disposed near the second and first ends of the tube, respectively, the first stopper being positioned to substantially prevent any of the medicament in the cartridge from contacting a needle mounted at the second end prior to firing of the jet injector;

firing the jet injector for:

moving the first stopper within the lumen towards the needle to cause a piercing end of the needle to pierce the first stopper to create a fluid pathway for the medicament through the needle, and

moving the second stopper within the lumen towards the second end to compress to compress the medicament to expel the medicament through the fluid pathway in a jet injection.

19. (Previously Presented) The method of claim 18, wherein movement of the second stopper toward the second end of the tube compresses the medicament between the first stopper and the second stopper to move the first stopper toward the second end of the tube for piercing the first stopper with the piercing end of the needle and create the fluid pathway for the medicament through the needle.

20. (Previously Presented) The method of claim 18, wherein the medicament is expelled through an injecting tip of the needle that extends beyond the second end of the tube.

21. (Previously Presented) The method of claim 18, wherein:
a first medicament component of the medicament is provided between the second and a third stopper in the lumen;
a second medicament component is provided between the third and first stoppers in the lumen;
the second stopper is moved to move the third stopper by compressing the first medicament component, thereby moving the first stopper for piercing with the piercing end by compressing the second medicament component; and
the first and second medicament components are mixed by moving the third stopper to an enlarged diameter portion of the lumen and moving second stopper to displace the first medicament to between the first and third stoppers.
22. (Previously Presented) The method of claim 18, wherein the cartridge that comprises the tube, needle, stoppers, and medicament, is fired by a jet injection device to inject the medicament.
23. (Previously Presented) The jet injector of claim 1, wherein the jet injector is configured for jet injection of the medicament from the fluid pathway.
24. (Previously Presented) The jet injector of claim 1, wherein the first stopper is configured to substantially prevent any of the medicament contained in the cartridge from contacting the needle prior to the firing of the jet injector.
25. (Previously Presented) The jet injector of claim 24, wherein the first stopper is slideable within the tube.
26. (Previously Presented) The jet injector of claim 24, wherein the medicament cartridge comprises only the two stoppers that contain all of the medicament therebetween.

27. (Previously Presented) The jet injector of claim 1, wherein the medicament cartridge is configured such that all of the medicament in the cartridge is injected together.

28. (Currently amended) The jet injector of claim 1, wherein the needle is in fixed association with the second end of the tube prior to firing the injector, and the first stopper is free of any device to puncture another of the stoppers.

29. (Previously Presented) The jet injector of claim 7, wherein the third stopper is configured for moving past the enlarged diameter towards the first stopper for injecting the medicament that passed from between the third and second stoppers together with the medicament between the third and first stoppers.

30. (Previously Presented) A jet injector, comprising:

a medicament cartridge comprising:

a medicament;

a tube having first and second ends and a lumen with a longitudinal axis for retaining the medicament therein;

a needle operatively associated with the second end of the tube and having a piercing end extending into the lumen;

a first stopper within and against the lumen located at a first position near the second end moveable within the lumen along the longitudinal axis; and

a second stopper within and against the lumen located at a second position near the first end moveable within the lumen along the longitudinal axis,

wherein movement of the first stopper with respect to the tube from the first position toward the needle causes the piercing end of the needle to pierce the first stopper to create a fluid pathway for the medicament through the needle, and movement of the second stopper with respect to the tube from the second position toward the second end of the tube compresses the medicament held between the second stopper and the first stopper so that the medicament is expelled through the fluid pathway.

31. (Currently amended) The jet injector of claim 30, wherein the needle is in fixed association with the second end of the tube prior to firing the injector.

32. (New) The injector of claim 1, wherein the first stopper has a proximal portion in sealing contact against the tube in lumen and a distal portion protruding distally from the proximal portion and spaced from tube in the lumen and disposed and configured to be pierced by the piercing end of the needle.

33. (New) The injector of claim 32, wherein the needle is fixed in a hub received within the tube, and the distal portion of the first stopper is configured to be received within the hub when pierced by the piercing end of the needle.